RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE: February 1999

BUDGET ACTIVITY: 3 - Advanced Technology Development

PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology

COST *($ In Thousands)*	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	22,406	22,791	21,479	22,077	21,792	23,880	24,479	25,088	Continuing	Continuing
670A Ordnance Technology	8,724	9,786	11,263	11,882	10,205	10,177	10,701	11,758	Continuing	Continuing
670B Guidance Technology	13,682	13,005	10,216	10,195	11,587	13,703	13,778	13,330	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: This Advanced Technology Development program develops and demonstrates conventional weapons technologies including advanced guidance and ordnance technologies for conventional weapons. This program includes development of: (1) conventional ordnance technologies, including warheads, fuzes, explosives, munition integration, and lethality and vulnerability assessments; and (2) advanced guidance technologies, including seekers, navigation and control, signal and image processing/algorithms, and simulation assessments for low-cost precision and adverse weather autonomous seekers for use on manned and unmanned aerospace vehicles. Payoff from this program is increased warhead penetration effectiveness, enhanced blast and fragmentation weapons, and precision fuze control for increased probability of target kill; and precision terminal guidance and the capability to operate autonomous weapons in adverse weather.

(U) B. Budget Activity Justification: This program is in the Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing system upgrades and/or new system developments that have military utility and address warfighter needs.

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(U) C. Program Change Summary ($ in Thousands):

	FY 1998	FY 1999	FY 2000	FY 2001	Total Cost
(U) Previous President's Budget/FY 1999 PB	21,622	23,244	23,983	23,848	Cont
(U) Appropriated Value	24,687	23,244			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-1,072	-453			
b. SBIR	-468				
c. Omnibus/Other Above Threshold Reprogrammings	-147				
d. Below Threshold Reprogrammings	-594				
(U) g. Adjustments to Budget Years Since FY 1999 PB			-2,504	-1,771	
(U) Current Budget Submit/FY 2000 PB	22,406	22,791	21,479	22,077	Cont

(U) Significant Program Changes: Changes to this program since the previous President's are due to higher priorities within the Science and Technology (S&T) Program.

FY 1999: $685 identified as a source for SBIR.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 3 - Advanced Technology Development	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology	PROJECT: 670A

COST *($ In Thousands)*	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
670A Ordnance Technology	8,724	9,786	11,263	11,882	10,205	10,177	10,701	11,758	Continuing	Continuing

(U) A. Mission Description: This project develops and demonstrates the operational effectiveness and utility of conventional (non-nuclear) ordnance technologies for current and future weapons delivered from manned and unmanned aerospace vehicles. The project includes development of conventional ordnance, including warheads, fuzes, explosives, sensitive explosives; hard target warheads; bombs, submunitions, and their dispensing mechanisms; weapon airframes and carriage; smart submunitions; munition integration; and lethality and vulnerability assessments.

(U) FY 1998 ($ in Thousands):

- (U) $4,297 Developed and demonstrated advanced conventional armament warhead technologies, including heavy metal liners, less sensitive, high blast penetrator explosives, dense metal warhead cases, fragmentation of thick-walled penetrators, advanced warhead shapes for improved penetration, improved warhead metals and design for high impact loading, and directional mass focus warheads. Advanced warhead technologies will provide better target penetration capabilities, enhanced kill probability against fragmentation sensitive targets.
- (U) $1,108 Developed and demonstrated advanced conventional armament fuze technologies, including hard target penetration, low-cost proximity for surface targets, and target imaging detection devices for air target defeat.
- (U) $3,319 Integrated advanced conventional armament technologies, including innovative aerospace vehicle carriage and release equipment, release concepts for small weapons, compact fin folding and deployment mechanisms, and compact airframe design and subsystem integration. Munition integration technologies will provide the capability of multiple carriage of small weapons, and allow communication between the aerospace vehicle and the weapons.
- (U) $8,724 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY: 3 - Advanced Technology Development	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology / PROJECT: 670A

(U) FY 1999 ($ in Thousands):

- (U) $3,418 Develop and demonstrate advanced conventional armament warhead technologies, including heavy metal liners, less sensitive, high blast penetrator explosives, dense metal warhead cases, fragmentation of thick-walled penetrators, advanced warhead shapes for improved penetration, improved warhead metals and design for high impact loading, and directional mass focus warheads. Advanced warhead technologies will provide better target penetration capabilities, enhanced kill probability against fragmentation sensitive targets.
- (U) $1,974 Develop and demonstrate advanced conventional armament fuze technologies, including hard target penetration, low-cost proximity for surface targets, and target imaging detection devices for air target defeat.
- (U) $4,100 Integrate advanced conventional armament technologies, including innovative aerospace vehicle carriage and release equipment, release concepts for small weapons, compact fin folding and deployment mechanisms, and compact airframe design and subsystem integration. Munition integration technologies will provide the capability of multiple carriage of small weapons, and allow communication between the aerospace vehicle and the weapons.
- (U) $294 Identified as a source for SBIR.
- (U) $9,786 Total

(U) FY 2000 ($ in Thousands):

- (U) $3,705 Develop and demonstrate advanced conventional armament warhead technologies, including heavy metal liners, less sensitive, high blast penetrator explosives, dense metal warhead cases, fragmentation of thick-walled penetrators, advanced warhead shapes for improved penetration, improved warhead metals and design for high impact loading, and directional mass focus warheads. Advanced warhead technologies will provide better target penetration capabilities, enhanced kill probability against fragmentation sensitive targets.
- (U) $5,387 Develop and demonstrate advanced conventional armament fuze technologies, including hard target penetration, low-cost proximity for surface targets, and target imaging detection devices for air target defeat.
- (U) $2,171 Integrate advanced conventional armament technologies, including innovative aerospace vehicle carriage and release equipment, release concepts for small weapons, compact fin folding and deployment mechanisms, and compact airframe design and subsystem integration. Munition integration technologies will provide the capability of multiple carriage of small weapons, and allow communication between the aerospace vehicle and the weapons.
- (U) $11,263 Total

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BUDGET ACTIVITY 3 - Advanced Technology Development	PE NUMBER AND TITLE 0603601F Conventional Weapons Technology
PROJECT 670A	

(U) FY 2001 ($ in Thousands):

- (U) $4,003 Develop and demonstrate advanced conventional armament warhead technologies, including heavy metal liners, less sensitive, high blast penetrator explosives, dense metal warhead cases, fragmentation of thick-walled penetrators, advanced warhead shapes for improved penetration, improved warhead metals and design for high impact loading, and directional mass focus warheads. Advanced warhead technologies will provide better target penetration capabilities, enhanced kill probability against fragmentation sensitive targets.
- (U) $5,990 Develop and demonstrate advanced conventional armament fuze technologies, including hard target penetration, low-cost proximity for surface targets, and target imaging detection devices for air target defeat.
- (U) $1,889 Integrate advanced conventional armament technologies, including innovative aerospace vehicle carriage and release equipment, release concepts for small weapons, compact fin folding and deployment mechanisms, and compact airframe design and subsystem integration. Munition integration technologies will provide the capability of multiple carriage of small weapons, and allow communication between the aerospace vehicle and the weapons.
- (U) $11,882 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 3 - Advanced Technology Development	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology / PROJECT: 670A

(U) B. Project Change Summary - Description of Significant Changes: Not Applicable.

(U) C. Other Program Funding Summary:

(U) Related Activities:
- (U) PE 0602602F, Conventional Munitions.
- (U) PE 0602111N, Anti-Air/Anti-Surface Warfare Technology.
- (U) PE 0603792N, Advanced Technology Demonstrations.
- (U) PE 0604407D, Joint Standoff Weapon.
- (U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) D. Acquisition Strategy: Not Applicable.

(U) E. Schedule Profile: Not Applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE: February 1999
BUDGET ACTIVITY: 3 - Advanced Technology Development	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology	PROJECT: 670B

COST *($ In Thousands)*	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
670B Guidance Technology	13,682	13,005	10,216	10,195	11,587	13,703	13,778	13,330	Continuing	Continuing

(U) A. Mission Description: This project develops and demonstrates affordable, autonomous, and adverse-weather advanced guidance technologies for air-to-air and air-to-ground conventional armament delivered from manned and unmanned aerospace vehicles. This project develops the following technologies: precision terminal seekers for enhanced target destruction; autonomous seekers for operation in adverse weather for increased accuracy; midcourse navigation sensors for standoff delivery weapons; and target detection and identification processing algorithms for reducing target location error and false alarm rates, while improving target kill probability.

(U) FY 1998 ($ in Thousands):

- (U) $6,504 Developed and demonstrated advanced conventional armament seeker technologies, including laser radar, millimeter wave, synthetic aperture radar, and conformal seeker arrays for multi-mode applications. These affordable seeker technologies will provide the capability to autonomously detect, acquire, and guide to targets of interest in adverse weather conditions while increasing probability of kill.
- (U) $2,964 Developed and demonstrated advanced conventional armament navigation and control technologies, including weapon guidance laws, state vector estimators, autopilots, inertial navigation, aerodynamic control, and anti-jam global positioning system techniques. These technologies will provide increased armament navigation accuracy and enhanced weapon control and operation in a electronic jamming environment.
- (U) $4,214 Integrated advanced conventional guidance technologies including seekers, navigation and control, signal and image processing/algorithm technologies, laser radar algorithms, super resolution techniques for millimeter waves and synthetic aperture radar, optical processing techniques, and demonstrated advanced conventional armament guidance capabilities. This guidance capability will provide better adverse weather performance, faster processing of target information, higher probability of target detection, and an operationally acceptable target false alarm rate.
- (U) $13,682 Total

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BUDGET ACTIVITY **3 - Advanced Technology Development**	PE NUMBER AND TITLE **0603601F Conventional Weapons Technology**

(U) FY 1999 ($ in Thousands):

- (U) $7,823 Develop and demonstrate advanced conventional armament seeker technologies, including laser radar, millimeter wave, synthetic aperture radar and conformal seeker arrays for multi-mode applications. These affordable seeker technologies will provide the capability to autonomously detect, acquire, and guide to targets of interest in adverse weather conditions while increasing probability of kill.
- (U) $1,002 Develop and demonstrate advanced conventional armament navigation and control technologies, including weapon guidance laws, state vector estimators, autopilots, inertial navigation, aerodynamic control, and anti-jam global positioning system techniques. These technologies will provide increased armament navigation accuracy and enhanced weapon control and operation in a electronic jamming environment.
- (U) $3,789 Integrate advanced conventional guidance technologies including seekers, navigation and control, signal and image processing/algorithm technologies, laser radar algorithms, super resolution techniques for millimeter waves and synthetic aperture radar, optical processing techniques, and demonstrated advanced conventional armament guidance capabilities. This guidance capability will provide better adverse weather performance, faster processing of target information, higher probability of target detection, and an operationally acceptable target false alarm rate.
- (U) $391 Identified as a source for SBIR.
- (U) $13,005 Total

(U) FY 2000 ($ in Thousands):

- (U) $2,699 Develop and demonstrate advanced conventional armament seeker technologies, including laser radar, millimeter wave, synthetic aperture radar and conformal seeker arrays for multi-mode applications. These affordable seeker technologies will provide the capability to autonomously detect, acquire, and guide to targets of interest in adverse weather conditions while increasing probability of kill.
- (U) $1,438 Develop and demonstrate advanced conventional armament navigation and control technologies, including weapon guidance laws, state vector estimators, autopilots, inertial navigation, aerodynamic control, and anti-jam global positioning system techniques. These technologies will provide increased armament navigation accuracy and enhanced weapon control and operation in a electronic jamming environment.
- (U) $6,079 Integrate advanced conventional guidance technologies including seekers, navigation and control, signal and image processing/algorithm technologies, laser radar algorithms, super resolution techniques for millimeter waves and synthetic aperture radar, optical processing techniques, and demonstrated advanced conventional armament guidance capabilities. This guidance capability will provide better adverse weather performance, faster processing of target information, higher probability of target detection, and an operationally acceptable target false alarm rate.
- (U) $10,216 Total

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE: February 1999
BUDGET ACTIVITY: 3 - Advanced Technology Development	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology
	PROJECT: 670B

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY: 3 - Advanced Technology Development	PE NUMBER AND TITLE: 0603601F Conventional Weapons Technology — PROJECT: 670B

(U) FY 2001 ($ in Thousands):

– (U) $2,570	Develop and demonstrate advanced conventional armament seeker technologies, including laser radar, millimeter wave, synthetic aperture radar and conformal seeker arrays for multi-mode applications. These affordable seeker technologies will provide the capability to autonomously detect, acquire, and guide to targets of interest in adverse weather conditions while increasing probability of kill.
– (U) $2,782	Develop and demonstrate advanced conventional armament navigation and control technologies, including weapon guidance laws, state vector estimators, autopilots, inertial navigation, aerodynamic control, and anti-jam global positioning system techniques. These technologies will provide increased armament navigation accuracy and enhanced weapon control and operation in a electronic jamming environment.
– (U) $4,843	Integrate advanced conventional guidance technologies including seekers, navigation and control, signal and image processing/algorithm technologies, laser radar algorithms, super resolution techniques for millimeter waves and synthetic aperture radar, optical processing techniques, and demonstrated advanced conventional armament guidance capabilities. This guidance capability will provide better adverse weather performance, faster processing of target information, higher probability of target detection, and an operationally acceptable target false alarm rate.
– (U) $10,195	Total

(U) B. Project Change Summary - Description of Significant Changes: Not Applicable.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 1999
BUDGET ACTIVITY 3 - Advanced Technology Development	PE NUMBER AND TITLE 0603601F Conventional Weapons Technology
	PROJECT 670B

(U) C. Other Program Funding Summary:

(U) Related Activities:

- (U) PE 0602111N, Anti-Air/Anti-Surface Warfare Technology.
- (U) PE 0603792N, Advanced Technology Demonstrations.
- (U) PE 0604618F, Joint Direct Attack Munitions.
- (U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) D. Acquisition Strategy: Not Applicable.

(U) E. Schedule Profile: Not Applicable.

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